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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,514	09/14/2001	Takeya Abe	018793-253	4410

7590 10/31/2008

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EXAMINER	
FRONDA, CHRISTIAN L	
ART UNIT	PAPER NUMBER
1652	

MAIL DATE	DELIVERY MODE
10/31/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/936,514	ABE ET AL.	
	Examiner	Art Unit	
	CHRISTIAN L. FRONDA	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,9,11-16 and 25-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,9,11-16 and 25-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, 3, 9, 11-16, and 25-31 are pending and under consideration in this Office Action. Additional grounds of rejection are presented in the instant Office Action.

2. Claim 1 is objected to for reciting the phrase "comprising contacting an amide compound-containing solution in contact with activated carbon". For clarity the phrase should be written as "comprising contacting an amide compound-containing solution with activated carbon" (emphasis added).

Claim Rejections - 35 U.S.C. § 112, 2nd Paragraph

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 3, 9, 11-16, and 25-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The arguments filed 07/29/2008 have been fully considered but are not persuasive.

As previously stated, claim 1 recites the phrase "microorganism fungus body containing nitrile hydratase or a processed product of the microorganism fungus body" which renders the claim vague and infinite. Regarding the arguments that the specification states how to prepare the "microorganism fungus body", the specification on page 9, lines 9-20, generically states how a microorganism can be planted in a liquid culture medium, grown at an appropriate temperature, and recovered from the liquid by centrifugal separation. It is not clear what is encompassed by the "microorganism fungus body" and the specification discloses bacterial strains such as MT-10827 (FERM BP-5785) which is not a fungus, but is instead an *E.coli* host cell transformed with a plasmid containing a polynucleotide encoding a bacterial nitrile hydratase from *Pseudonocardia thermophila* JCM3095 (see US Patent 5,910,4352). Although the specification

states that the "processed product" can be an extract and a trituration product (see page 9, line 21), however, it is unclear if such "processed product" still contains the nitrile hydratase of the "microorganism fungus body". Dependent claims 3, 9, 11-16, and 25-31 are also included in the rejection because they do not correct the defect of claim 1. For examination purposes it is assumed that the claim encompasses a microorganism comprising a nitrile hydratase and a processed product of the microorganism comprising a nitrile hydratase.

Claim Rejections - 35 U.S.C. § 112, 1st Paragraph

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 3, 9, 11-16, and 25-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The arguments filed 07/29/2008 have been fully considered. The grounds of rejection for the recited "nitrile hydratase" have been withdrawn. However, the grounds of rejection for the "processed product" stand for the reasons of record as further explained.

In regard to the recited "processed product", the specification does not provide guidance regarding what structural features of the "processed product" are responsible for the production of the amide compound in the amide compound-containing solution which is to be contacted with activated carbon. To describe a genus, a specification must provide guidance regarding which species have the recited function. In *University of California v. Eli Lilly and Co.*, 119 F.3d 1559 (Fed. Cir. 1997), the court held that claims generically reciting cDNA encoding vertebrate or mammalian insulin were not adequately described by the disclosure of cDNA encoding rat insulin. *Id.* at 1568. The court held that

a generic statement such as "vertebrate insulin cDNA" or "mammalian insulin cDNA," without more, is not an adequate written description of the genus because it does not distinguish the claimed genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus.

The method steps reciting the products must comply with the written description requirement. Recitation of the "processed product of the microorganism fungus body" do not define any structural features that are responsible for the production of the amide compound in the amide compound-containing solution which is to be contacted with activated carbon. The specification does not provide a correlation between any "processed product of the microorganism fungus body" and production of any amide compound. There is no art-recognized correlation between any "processed product of the microorganism fungus body" and production of any amide compound.

As stated in the previous Office Actions, the specification discloses a MT-10827 (FERM BP-5785) which is not a not a fungus, but is instead an *E.coli* host cell transformed with a plasmid containing a polynucleotide encoding a bacterial nitrile hydratase from *Pseudonocardia thermophila* JCM3095 (see US Patent 5,910,4352), and its use in converting acrylonitrile to its corresponding amide acrylamide. However, the specification fails to disclose additional "processed products" as encompassed by the claims.

Without disclosure of which peptides, polynucleotides, or other organic molecules in the recited "processed product of the microorganism fungus body" which are responsible for the production of the amide compound in the amide compound-containing solution which is to be contacted with activated carbon, the claims are not adequately described. Those of ordinary skill in the art would not be able to identify without further testing what specific "processed product of the microorganism fungus body" can be used in the claimed method.

Claim Rejections - 35 U.S.C. § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 3, 9, 11-16, 25-31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Oriel et al. (WO 99/55719; reference of record) in view of Chen. (J Biol Chem. 1967 Jan 25;242(2):173-81; reference of record). The reference teachings and rejection have been stated in the previous Office Actions.

According to MPEP 2143:

> "Exemplary rationales that may support a conclusion of obviousness include:
>
> (A) Combining prior art elements according to known methods to yield predictable results;
>
> (B) Simple substitution of one known element for another to obtain predictable results;
>
> (C) Use of known technique to improve similar devices (methods, or products) in the same way;
>
> (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
>
> (E) " Obvious to try " – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
>
> (F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
>
> (G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.
>
> Note that the list of rationales provided is not intended to be an all-inclusive list. Other rationales to support a conclusion of obviousness may be relied upon by Office personnel."

As stated in the previous Office Actions, Oriel et al. teach a process where BR449 cells are contacted with acrylonitrile to produce a solution containing acrylamide, the said BR449 cells are separated from the reaction mixture, the said acrylamide solution is treated with

activated charcoal (an activated carbon), to remove contaminants and the acrylamide is concentrated or precipitated by distillation or evaporation under reduced pressure (see entire publication especially p. 17, line 17 to p.18, line 24). Oriel et al. further teach that other unsaturated aliphatic nitrile compounds such as crotononitrile and methacrylonitrile that can be converted using the nitrile hydratase of BR449 (see p. 36, lines 27-28).

The reference of Oriel et al. clearly shows that activated charcoal, which is known in the art to be treated with acid in order to activate the charcoal, was used to purify acrylamide from the reaction mixture. Therefore, one of ordinary skill in the art at the time the invention was made would recognize and predict that nitrile compounds containing an unsaturated bond are stable in acidic conditions. Furthermore, the process of Oriel et al. would inherently remove impurities including proteins since the process involves not only contacting the solution with activated carbon but also includes steps for concentrating or precipitating by distillation or evaporation the amide solution, thereby removing contaminating proteins.

As stated in the previous Office Actions, Chen teach process steps for removing lipid impurities by acid-charcoal treatment, using an acidic range of pH 3 to pH 7 at 2°C where the charcoal is made from wood (see entire publication, especially Figs. 1-4 and pp. 174-177). The reference of Chen clearly shows that acid-charcoal treatment, using an acidic range of pH 3 to pH 7 at 2°C, is used for removing lipid impurities, which are expected to be contained within the recited "microorganism fungus body", and "processed product of the microorganism fungus body". Therefore, one of ordinary skill in the art at the time the invention was made would recognize and predict that in order to remove such lipid impurities from the reaction mixture, acid-charcoal treatment using an acidic range of pH 3 to pH 7 at 2°C is required. Furthermore, one of ordinary skill in the art at the time the invention was made would try to optimize the pH and temperature of the reaction mixture in order to obtain the highest, purified yield of the amide compound from the reaction mixture.

The arguments filed 07/29/2008 have been fully considered but they are not persuasive for the reasons of record. The examiner has determined the scope and contents of the prior art, ascertained the differences between the prior art and the amended claims at issue, and found the claimed invention to have been obvious in light of the combined teachings of the references. One of ordinary skill in the art at the time the invention was made would have a reasonable

expectation of success because the process of Oriel et al. as modified above would inherently remove impurities including proteins since the process involves not only contacting the solution with activated carbon but also includes steps for concentrating or precipitating by distillation or evaporation the amide solution, thereby removing contaminating proteins. One of ordinary skill in the art at the time the invention was made would have a reasonable expectation of success because the process of Oriel et al. as modified above by the teachings of Chen et al. would remove lipid impurities acid-charcoal treatment using an acidic range of pH 3 to pH 7 at 2°C. Furthermore, one of ordinary skill in the art at the time the invention was made would try to optimize the pH and temperature of the reaction mixture in order to obtain the highest, purified yield of the amide compound from the reaction mixture. Submission of a declaration showing unexpected results may aid in overcoming the rejection.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1, 3, 9, 11-16, and 25-31 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 6,849,432 in view of the combined teachings of Oriel et al. (WO 99/55719; reference of record) and Chen. (J Biol Chem. 1967 Jan 25;242(2):173-81; reference of record. Although the conflicting claims are not identical, they are not patentably distinct from each other because as explained below.

Claims 1-4 of U.S. Patent No. 6,849,432 encompass a process for producing an amide compound, comprising reacting a microorganism fungus body containing nitrile hydratase or a processed product of the microorganism fungus body with a nitrile compound in an aqueous medium.

Oriel et al. teach a process where BR449 cells are contacted with acrylonitrile to produce a solution containing acrylamide, the said BR449 cells are separated from the reaction mixture, the said acrylamide solution is treated with activated charcoal (an activated carbon), to remove contaminants and the acrylamide is concentrated or precipitated by distillation or evaporation under reduced pressure (see entire publication especially p. 17, line 17 to p.18, line 24). Oriel et al. further teach that other unsaturated aliphatic nitrile compounds such as crotononitrile and methacrylonitrile that can be converted using the nitrile hydratase of BR449 (see p. 36, lines 27-28).

Chen teach process steps for removing lipid impurities by acid-charcoal treatment, using an acidic range of pH 3 to pH 7 at 2^{o}C where the charcoal is made from wood (see entire publication, especially Figs. 1-4 and pp. 174-177). The reference of Chen clearly shows that acid-charcoal treatment, using an acidic range of pH 3 to pH 7 at 2^{o}C, is used for removing lipid impurities, which are expected to be contained within the recited "microorganism fungus body", and "processed product of the microorganism fungus body".

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Oriel et al. such that the amide solution is produced by microorganism fungus body containing nitrile hydratase or a processed product of the

microorganism fungus body as taught by U.S. Patent No. 6,849,432, and the amide solution is subjected to acid-charcoal treatment as taught by Chen. One of ordinary skill in the art at the time the invention was made would have been motivated to do this for the purposes of having a simple and beneficial purification process that produces an amide compound and removes impurities including lipid impurities.

The reference of Oriel et al. clearly shows that activated charcoal, which is known in the art to be treated with acid in order to activate the charcoal, was used to purify acrylamide from the reaction mixture. Therefore, one of ordinary skill in the art at the time the invention was made would recognize and predict that nitrile compounds containing an unsaturated bond are stable in acidic conditions. Furthermore, the process of Oriel et al. would inherently remove impurities including proteins since the process involves not only contacting the solution with activated carbon but also includes steps for concentrating or precipitating by distillation or evaporation the amide solution, thereby removing contaminating proteins. The reference of Chen clearly shows that acid-charcoal treatment, using an acidic range of pH 3 to pH 7 at 2^{o}C, is used for removing lipid impurities, which are expected to be contained within the recited "microorganism fungus body", and "processed product of the microorganism fungus body". Therefore, one of ordinary skill in the art at the time the invention was made would recognize and predict that in order to remove such lipid impurities from the reaction mixture, acid-charcoal treatment using an acidic range of pH 3 to pH 7 at 2^{o}C is required. Furthermore, one of ordinary skill in the art at the time the invention was made would try to optimize the pH and temperature of the reaction mixture in order to obtain the highest, purified yield of the amide compound from the reaction mixture.

Conclusion

11. No claims are allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian L Fronda whose telephone number is (571)272-0929. The examiner can normally be reached Monday-Thursday and alternate Fridays between 9:00AM - 5:00PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nashaat Nashed can be reached on (571)272-0934. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christian L. Fronda/
Primary Examiner
Art Unit 1652